

# On Wells and Wellness: Oil and Gas Flaring as a Potential Risk Factor for Preterm Birth

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Several studies have examined the association between unconventional oil and gas development and adverse birth outcomes. But up to now, no study is known to have looked specifically at flaring—the controlled burning of natural gas at the well site to relieve pressure or dispose of waste gas.<sup>1</sup> In a recent article in *Environmental Health Perspectives*, investigators report their findings on flaring and maternal and fetal outcomes.<sup>2</sup>

The Eagle Ford Shale is one of the most productive oil and gas regions in the United States. Texas state regulations had previously restricted flaring, but these have since been relaxed; flaring is now common practice in the Eagle Ford Shale.<sup>3</sup> Gas flaring, in particular, has increased substantially in the United States during the last 5 years, increasing by 48% just between 2017 and 2018.<sup>4</sup> This increase was seen mainly in the Bakken Shale in North Dakota and the Permian Basin and Eagle Ford shales in Texas, areas that saw rapid growth in 2018.<sup>4</sup> Flaring releases multiple greenhouse gases and harmful air pollutants.<sup>5</sup> It also causes noise and light pollution,<sup>6</sup> potentially affecting sleep quality and increasing stress.

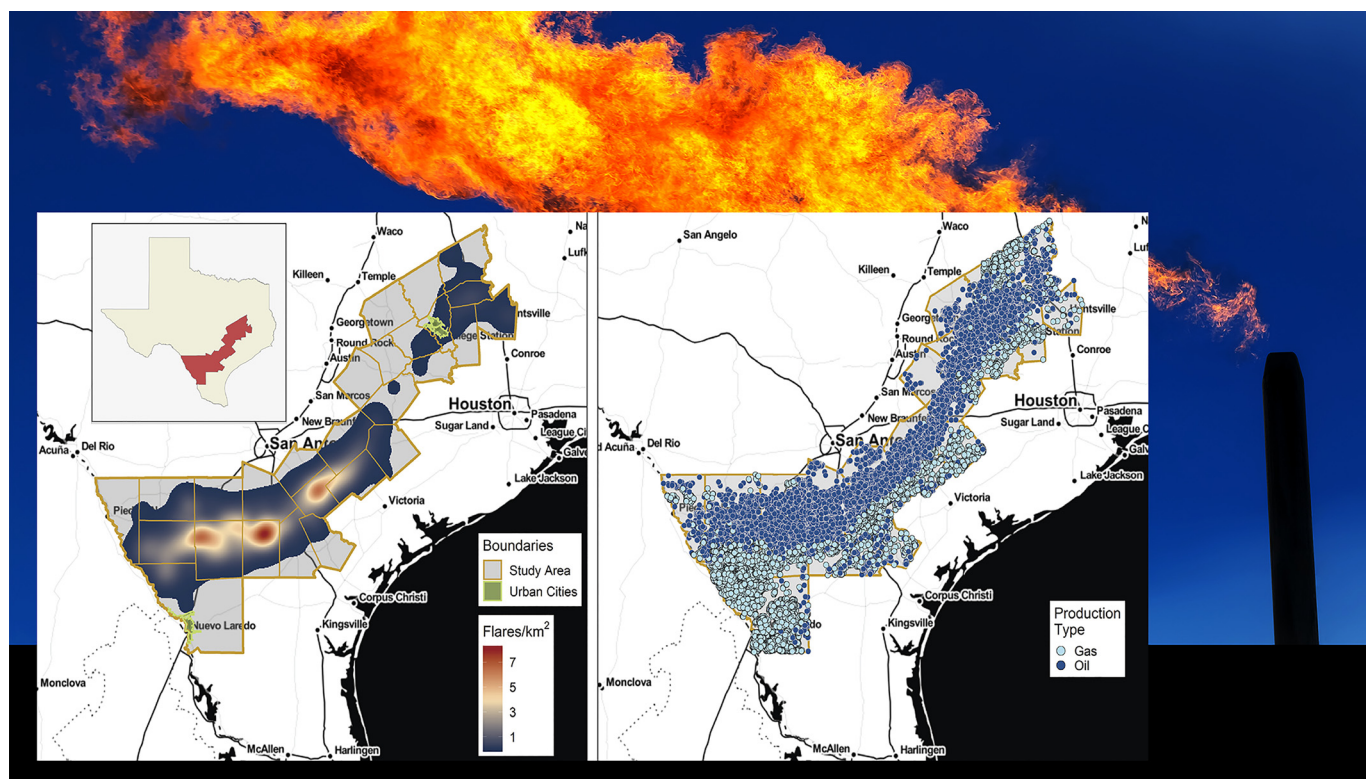
Using a retrospective cohort design, researchers obtained birth records from more than 23,000 women living in the 27 counties associated with the Eagle Ford Shale during 2012 to 2015. They linked these records with satellite observations of flaring within 5 km of the residence where each woman lived when she gave birth.

Overall, being exposed to 10 or more nightly flare events within 5 km of home was associated with a shorter average length of gestation and with 50% higher odds of having a preterm birth, compared with having no flaring events near home. Flaring was not associated with birth weight or fetal growth restriction.

“Roughly one in ten women in the U.S. will have a preterm baby<sup>7</sup>; our study suggests that for women living near a significant amount of flaring, those odds [may be] higher,” says lead author Lara Cushing, an assistant professor of environmental health sciences at the University of California, Los Angeles.

The association between flaring and preterm birth appeared to be limited to Hispanic women, who made up 55% of the study population and were exposed to a higher number of flares on average than non-Hispanic white women. For these mothers, the substantial increase was on par with the increases seen for women who smoke during pregnancy.<sup>8</sup> “As far as we are aware, this is the first study to [suggest] greater health impacts associated with oil and gas development among women of color,” says Jill Johnston, an assistant professor at the University of Southern California, who co-led the study with Cushing.

Johnston says a long history of racial discrimination in Texas has resulted in inequalities in wealth, housing, employment, and environmental exposures that may make Hispanics more vulnerable to flaring. “For example,” she explains, “they may be more likely to



The Eagle Ford Shale is one of the most productive oil and gas regions in the United States. The panel on the left shows the density of nightly flare events, and the righthand panel shows the density of oil and gas wells across the 27-county study area. Images: © Leonid Ikan/Shutterstock (background); Cushing et al. (2020); 10.1289/EHP6394 (inset).

be exposed to other harmful pollutants such as pesticides or lead and to experience chronic stress, which could make them more susceptible to flaring-related exposures.”

One limitation of this study is that using distance from flaring as a proxy for exposure does not necessarily indicate that flaring itself causes preterm birth. “Assigning one woman a higher exposure based on the fact that there is a greater density of wells or flaring events within a given radius of her home doesn’t tell us anything about the specific chemicals or other stressors—for example, noise or light—to which she was actually exposed,” says Kristina Walker Whitworth, an associate professor of epidemiology and population sciences at the Baylor College of Medicine who was not involved in the study. “Rather, there are multiple chemical and nonchemical stressors that women who live nearer to these activities *may possibly* experience.”

Cushing agrees that this is a limitation. However, she adds, “The metric we used has as a strength the fact that it likely captures the combined impact of all of these possible mechanisms.” Indeed, the study itself does suggest that factors besides flaring were also associated with preterm birth and reduced birth weight.

“We saw evidence that living near oil and gas wells was also associated with adverse birth outcomes, independent of flaring,” says Johnston. “Women who lived within five kilometers of many active wells had an increased odds of preterm birth, and their babies weighed less on average than women who did not live within five kilometers of any wells. This suggests that there is something else about living near oil and gas wells that is also adversely impacting pregnancy and that regulating flaring alone may not be enough to protect infants in areas of oil and gas development.”

The study’s findings suggest there are tradeoffs and human health costs of oil and gas development. Preterm birth has been associated with neurodevelopmental problems, cognitive dysfunction, and many other adverse downstream impacts.<sup>9</sup> “Our findings suggest that the oil and gas boom in South Texas has come at a cost to the health of nearby communities, particularly communities of color,” says Cushing. “Reducing or eliminating the amount of

flaring through tighter regulations could help prevent babies from being born too soon.”

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